

Rapid Watershed Assessment

Rush - Vermillion

(MN / WI) HUC: 07040001



Rapid watershed assessments provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments help land-owners and local leaders set priorities and determine the best actions to achieve their goals.

Introduction

The Rush-Vermillion 8-Digit Hydrologic Unit Code (HUC) subbasin is located within the Western Corn Belt Plains, North Central Hardwoods, and Driftless Area Ecoregions of Minnesota and Wisconsin.

Approximately ninety six percent of the 709,411 acres in this HUC are privately owned. The remaining acres are state, county, federal, tribal or conservancy lands or covered by open water.

Assessment estimates indicate 2,421 farms in the watershed. Approximately forty nine percent of the operations are less than 180 acres in size, forty six percent are from 180 to 1000 acres in size, and the remaining farms are greater than 1000 acres in size.

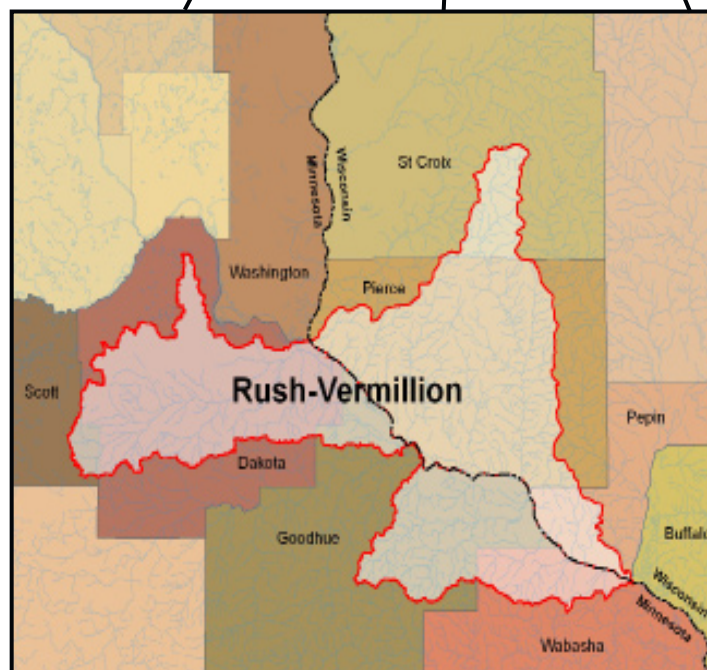
The main resource concerns in the watershed are sediment and erosion control, stormwater management, drinking and source water protection, animal waste management, nutrient management and wetland management. Additional concerns include irrigation management, streambank erosion, and wildlife habitat.

Many of the resource concerns relate directly to topography, agricultural practices and increased development in the region resulting in flooding and increased sediment and pollutant (fecal coliform, nitrogen, phosphorus) loadings to surface and ground waters.



County Totals

County	Acres in HUC	% HUC
Washington	10	0.0%
Dakota	199,425	28.1%
Scott	9,882	1.4%
Goodhue	131,806	18.6%
Wabasha	40,899	5.8%
St Croix	36,035	5.1%
Pierce	260,572	36.7%
Pepin	31,393	4.4%
Buffalo	2	0.0%
Total acres:	709,411	100%



Physical Description

As the main waterbody of the watershed, the Vermillion River is a “prairie river” that slowly winds through rural, suburban, and urban areas in the southwest Twin Cities Metropolitan Area, extending into Wisconsin.

Beginning in southeastern Scott County, the River flows across central Dakota County to the city of Hastings where it drops 90 feet. Below the falls the river meanders a short way downstream and then splits: one branch flows north to the Mississippi River; the other flows south paralleling the Mississippi River 20 miles before joining the Mississippi River near the City of Red Wing in Goodhue County.

Approximately 49 miles of the Vermillion River (main stem and tributaries) are designated trout streams, making the river a unique natural resource in a rapidly growing metropolitan area. According to Trout Unlimited, it is the only world class trout stream within a major metropolitan Area in the United States.

The Minnesota portion of the basin also includes Wells Creek, which meanders through the scenic bluffs of Southeastern Minnesota, and forms extensive floodplain forest within Frontenac State Park before entering the Mississippi River. The immediate watershed surrounding the creek is primarily agricultural, and includes fields, forests, hills and bluffs in Goodhue and Wabasha Counties.

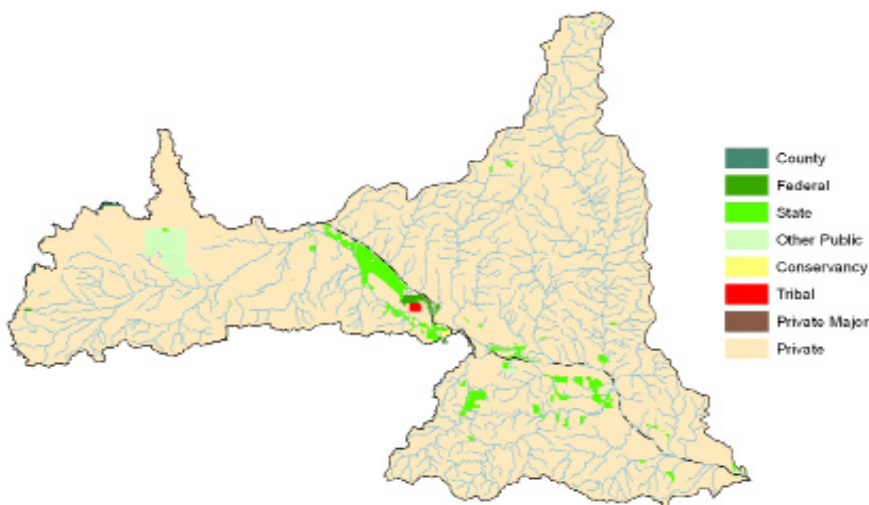
The Rush River originates in south central St. Croix County Wisconsin. It flows south for 35 miles where it enters the Mississippi River in southeastern Pierce County. The watershed drains rolling agricultural and wooded areas with many tributaries originating in steep coulees.

Precipitation in the Rush-Vermillion watershed ranges from 29 to 33 inches each year. A narrow majority of the land use within the watershed is agricultural, with crop and pasture lands accounting for over 60% of the overall acres.

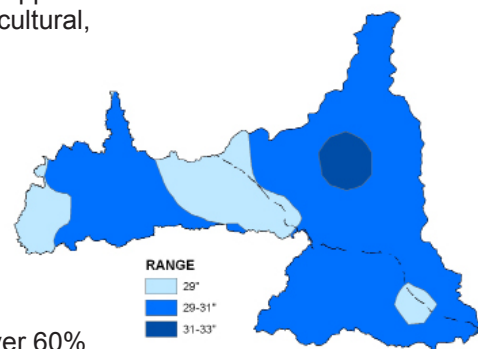
Predominate land covers / land uses are Row Crops (45%), Forest (19.5%), Grass, Pasture, Hay (17%), and Residential/Commercial Development (10%).

Ownership

Ownership Type	Acres	% of HUC
Conservancy	335	0.0
County	412	0.1
Federal	1,541	0.2
State	16,651	2.3
Other	8,199	1.2
Tribal	476	0.1
Private Major	26	0.0
Private	681,771	96.1
Total Acres:	709,411	100



Average Precipitation



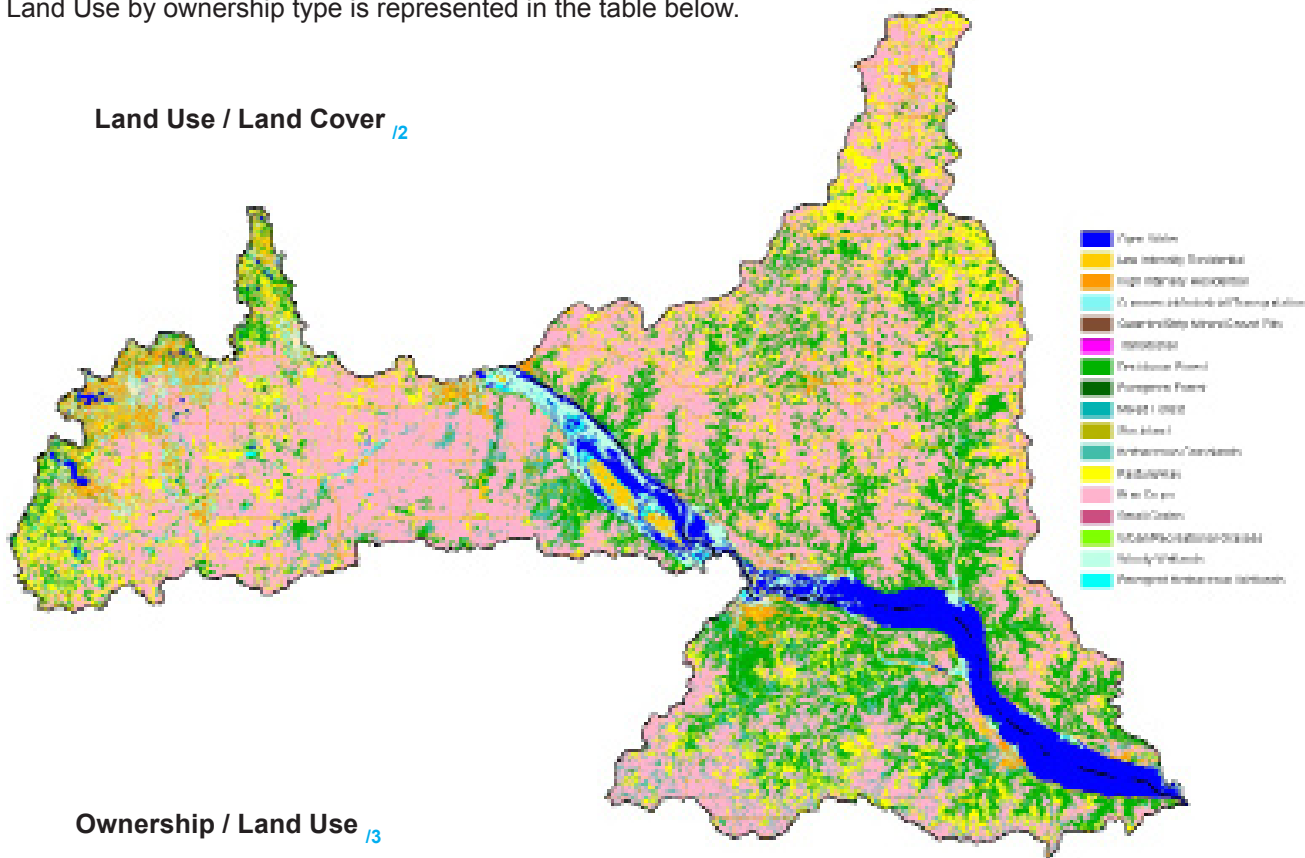
* Ownership totals derived from 2007 MN DNR GAP Stewardship and Wisconsin GAP Coverage data and are the best suited estimation of land stewardship available on a statewide scale at time of publication. See the bibliography section of this document for further information.

Ownership / Land Use

The Rush - Vermillion watershed covers an area of 709,411 acres. Approximately ninety six percent of the land in the watershed is owned by private landholders (681,771 acres). The second largest ownership type is State, with approximately 16,650 acres (2.3%), followed by Other Public with 8,200 acres (1.2%), Federal with 1,540 acres (0.2%), Tribal with 476 acres (0.1%), County with 412 acres (0.1%) and Conservancy, with approximately 335 acres (<0.1%). Private Major Comprises the smallest ownership class, with 26 acres.

Land Use by ownership type is represented in the table below.

Land Use / Land Cover ^{/2}



Ownership / Land Use ^{/3}

Landcover/Use	Public		Private**		Tribal		Total Acres	Percent
	Acres	% Public	Acres	% Private	Acres	% Tribal		
Forest	5,085	0.7%	133,414	18.8%	0	0.0%	138,499	19.5%
Grass, etc	2,793	0.4%	118,004	16.6%	12	0.0%	120,809	17.0%
Orchards	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Row Crops	5,726	0.8%	309,832	43.7%	0	0.0%	315,557	44.5%
Shrub etc	313	0.0%	2,863	0.4%	0	0.0%	3,176	0.4%
Wetlands	7,208	1.0%	12,755	1.8%	229	0.0%	20,191	2.8%
Residential/Commercial	1,415	0.2%	69,994	9.9%	171	0.0%	71,580	10.1%
Open Water*	4,254	0.6%	35,276	5.0%	65	0.0%	39,595	5.6%
* ownership undetermined ** includes private-major								
Watershed Totals:	26,793	3.78%	682,138	96.2%	476	0.1%	709,408	100%

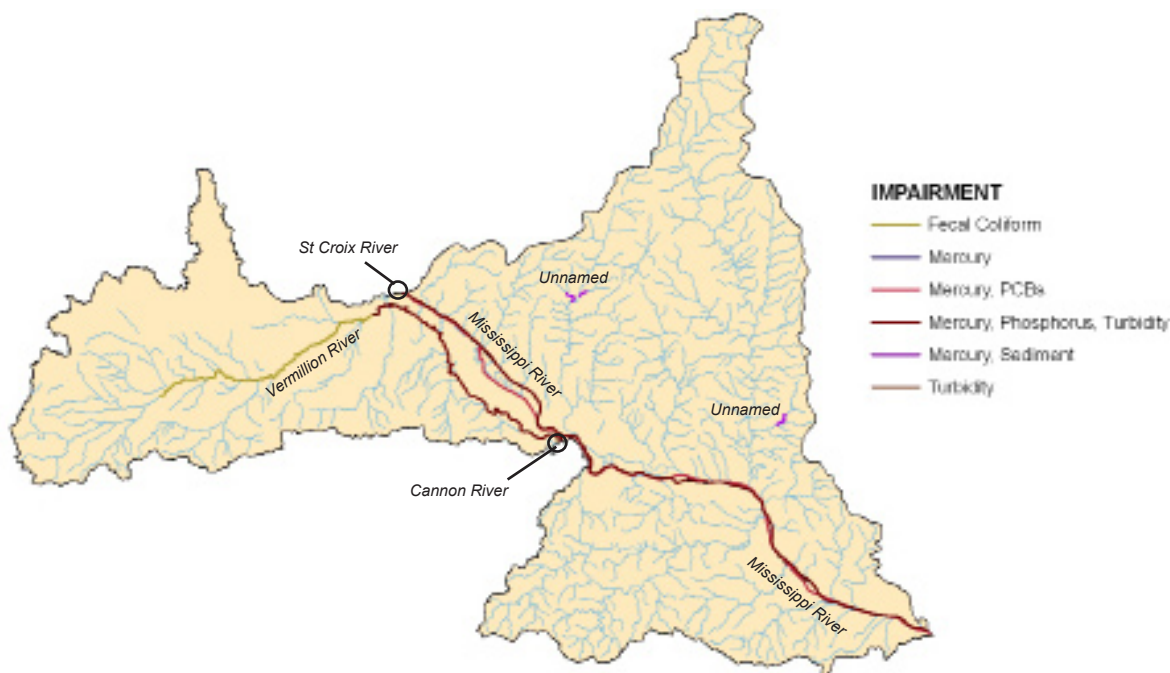
Physical Description (continued)

		ACRES	cu. ft/sec	
Stream Flow Data	USGS 05344500 MISSISSIPPI RIVER AT PRESCOTT, WI	2006 Total Avg.	22,800	
		May – Sept. 2007 Avg.	13,420	
Stream Data ¹⁴ (*Percent of Total HUC Stream Miles)		ACRES/MILES	PERCENT	
	Total Miles – Major (100K Hydro GIS Layer)	1,390	---	
	303d/TMDL Listed Streams (DEQ)	140	10.1%	
Riparian Land Cover/Land Use ¹⁵ (Based on a 100-foot buffer on both sides of all streams in the 100K Hydro GIS Layer)	Forest	10,554	31.4%	
	Grain Crops	0	0.0%	
	Grass, etc	6,096	18.2%	
	Orchards	0	0.0%	
	Row Crops	9,844	29.3%	
	Shrub etc	186	0.6%	
	Wetlands	2,078	6.2%	
	Residential/Commercial	1,955	5.8%	
	Open Water	2,844	8.5%	
	Total Buffer Acres:	33,558	100%	
	Crop and Pastureland Land Capability Class ¹⁶ (Croplands & Pasturelands Only) (1997 NRI Estimates for Non-Federal Lands Only)	1 – slight limitations	2,000	1%
2 – moderate limitations		94,400	53%	
3 – severe limitations		43,200	24%	
4 – very severe limitations		24,400	14%	
5 – no erosion hazard, but other limitations		2,200	1%	
6 – severe limitations; unsuitable for cultivation; limited to pasture, range, forest		9,000	5%	
7 – very severe limitations; unsuitable for cultivation; limited to grazing, forest, wildlife habitat		1,800	1%	
8 – miscellaneous areas; limited to recreation, wildlife habitat, water supply		0	0%	
Total Croplands & Pasturelands		177,000	-	
	TYPE OF LAND	ACRES	% of Crop Lands	% of HUC
Irrigated Lands ¹⁷ (1997 NRI Estimates for Non-Federal Lands Only)	Cultivated Cropland / Pastureland	28	0%	0%
	Uncultivated Cropland	0	0%	0%
	Total Irrigated Lands	0	0%	0%

Assessment of Waters

Section 303(d) of the Clean Water Act states that water bodies with impaired use(s) must be placed on a state's impaired waters list. A water body is "Impaired" or polluted when it fails to meet one or more of the Federal Clean Water Act's water quality standards. Federal Standards exist for basic pollutants such as sediment, bacteria, nutrients, and mercury. The Clean Water Act requires States to identify and restore impaired waters.

2006 303d Listed Streams - Rush-Vermillion Watershed⁸



Listed Stream	Impairment	Affected Use
St Croix River	Mercury, PCBs	Aquatic Life and Aquatic Consumption
Unnamed	Mercury, Sediment	Aquatic Life and Aquatic Consumption
Mississippi River	Mercury, PCBs	Aquatic Life and Aquatic Consumption
St. Croix River; Kinnickinnic R (Wi) To Mississipp	Mercury	Aquatic Consumption
Mississippi River; Lock & Dam #2 To St. Croix R (R	Mercury, Phosphorus, Turbidity	Aquatic Life and Aquatic Consumption
Unnamed (2)	Mercury, Sediment	Aquatic Life and Aquatic Consumption
Vermillion River; S Br Vermillion R To The Hasting	Fecal Coliform	Aquatic Recreation
Vermillion River; Below Trout Stream Portion To So	Fecal Coliform	Aquatic Recreation
Cannon River; Huc Boundary In Rice Lk Bottoms	Turbidity	Aquatic Life
Vermillion River/Vermillion Slough; Hastings Dam	Mercury, Phosphorus, Turbidity	Aquatic Life and Aquatic Consumption
Mississippi River; St. Croix R To Chippewa R (Wi)	Mercury, Phosphorus, Turbidity	Aquatic Life and Aquatic Consumption

Assessment of Waters

Impaired waters lists, updated every two years, identify assessed waters that do not meet water quality standards. The primary tool for addressing impaired waters is a pollution reduction plan called a Total Maximum Daily Load, or TMDL. After impaired use(s) have been identified, the TMDL process identifies all sources of each pollutant. The plan then determines how much each source must reduce its contribution in order to meet the applicable water quality standard. The Clean Water Act requires a completed TMDL for each water quality violation identified on a state's impaired waters list. Lakes or river reaches with multiple impairments require multiple TMDLs.

2006 TMDL Listed Lakes - Rush-Vermillion Watershed¹⁸



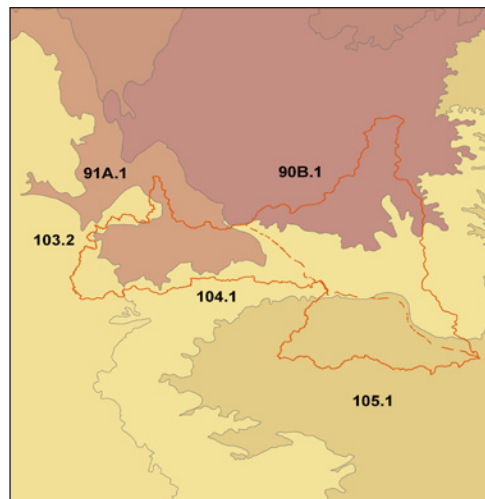
Waterbody Name	Impairment	Affected Use
Long	Excess nutrients	Aquatic Recreation
Farquar	Excess nutrients	Aquatic Recreation
Keller	Excess nutrients	Aquatic Recreation
Marion	Mercury	Aquatic Consumption
Crystal	Excess nutrients, Mercury	Aquatic Recreation and Aquatic Consumption
Lee	Excess nutrients	Aquatic Recreation
Laclavon	Mercury	Aquatic Consumption
Pepin	Excess nutrients	Aquatic Recreation

Common Resource Areas

The Rush-Vermillion Watershed encompasses five common resource areas, 105.1, 104.1, 103.2, 90B.1, and 91A.1

105.1 Driftless Loess Hills and Bedrock: Highly dissected hills and valleys. Well drained and moderately well drained silty soils over bedrock residuum. Predominantly cropland and grazing land on ridge tops and valley bottoms with a mix of dairy, beef and cash grain agricultural enterprises. Deciduous forest on steep side slopes. Primary resource concerns are cropland soil erosion, surface water quality, grazing land and forestland productivity, stream bank erosion, and erosion during timber harvest.

104.1 Silty and Loamy Mantled Firm Till Plain: Gently sloping to very steep dissected till plain. Soils are predominantly well drained and are formed in thin silty material over loamy till, underlain by sedimentary bedrock. Cropland and grazing land on ridge tops and valley bottoms with a mix of dairy, beef and cash grain agricultural enterprises. Deciduous forest on side slopes. Primary resource concerns are cropland erosion, surface water quality, grazing land and woodland productivity, and soil erosion during timber harvest.



103.2 Iowa and Minnesota Rolling Prairie/Forest Moraines: Primarily loamy glacial till soils with some potholes, outwash and flood plains. Gently undulating to rolling with relatively short, complex slopes. Organic soils occur in the larger basins. Primary land use is cropland. Corn, soybeans, and hay are the major crops. Native vegetation was dominantly mixed tall grass prairie and deciduous trees. Resource concerns are water and wind erosion, nutrient management, water quality and wildlife habitat management.

90B.1 Dense Till Ground Moraine: Nearly level and gently sloping moderately well and somewhat poorly drained loamy soils underlain by loamy glacial residuum and bedrock. Mostly cropland and grazing land, with areas of mixed deciduous and coniferous forest, wetlands, and a few lakes. Dairy and beef production with some cash grain are the primary agricultural enterprises. Primary resource concerns include nutrient management, cropland soil erosion, grazing land productivity, and forestry management.

90A.1 Loamy Till Ground Moraines and Drumlins: Nearly level to moderately steep, loamy, sandy, and organic soils. Mixed deciduous and coniferous forest is the primary land use with some glacial lakes and wetlands. Scattered cropland and grazing land are present. Cropland productivity is limited by the short length of the growing season. Primary resource concerns are timber management, wildlife habitat, recreation and agricultural forage production. Surface water quality is a localized concern.

Geology / Soils /10

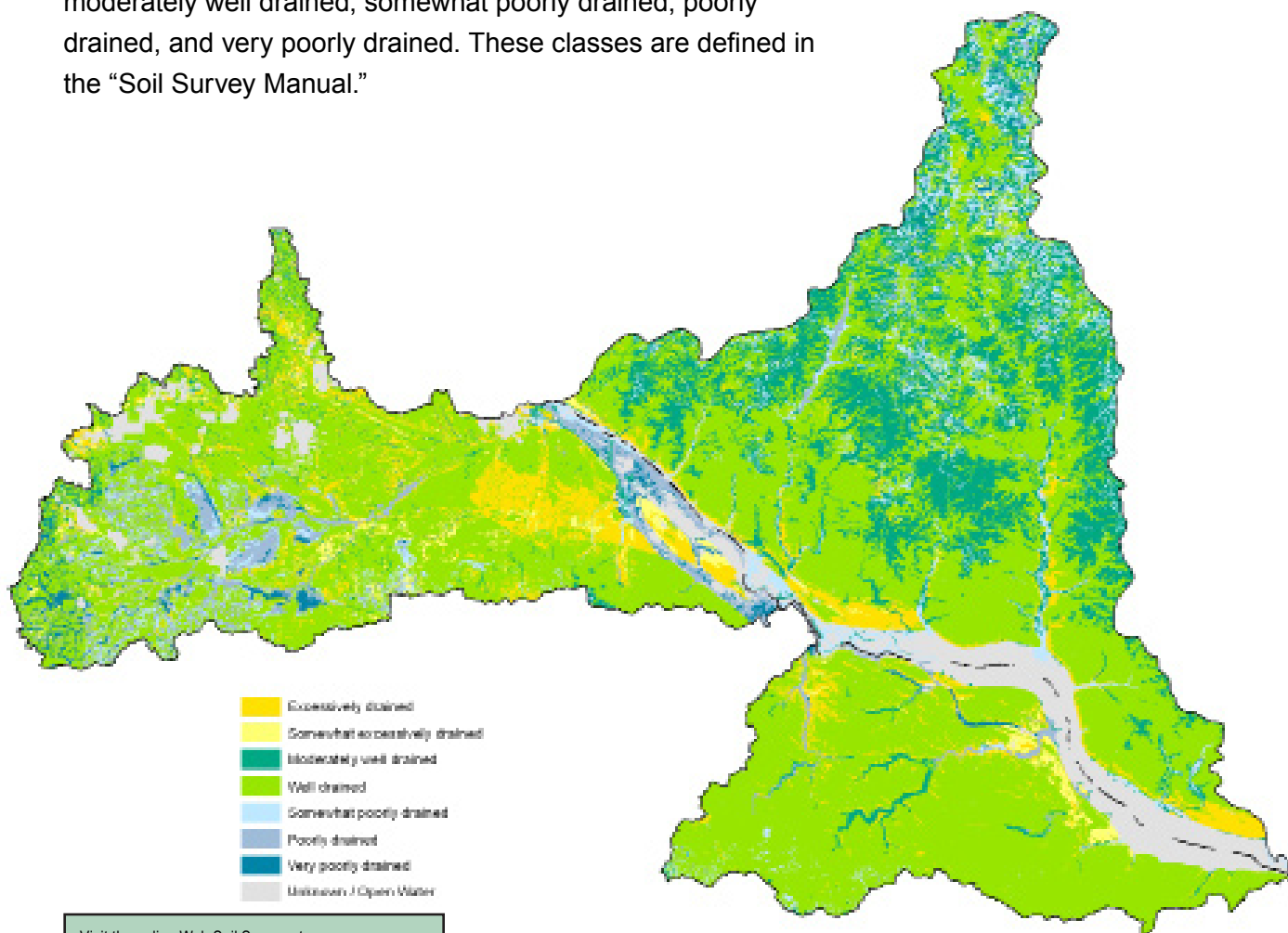
The soils and land types of the region have been formed largely in the deposits laid down by wind, water, and ice during the Pleistocene. An extensive mantle of loess, ranging from a few inches to more than 20 feet deep, was deposited by wind during the retreat of the Iowan glacier, covering much of the watershed east of the Iowan glacial border. The loess covered area resembles the larger driftless area, but shows evidence in some areas of having been covered with ice during the glacial period. This part of the area had been thoroughly dissected through long-continued and uninterrupted erosion. This came about because of differential weathering, uninterrupted by glaciation, of the underlying alternate layers of hard limestone and friable sandstone. On the steep valley slopes, particularly in the larger valleys, where geologic erosion has been active, the bedrock is exposed or the mantle of loess is thin.

Visit the online Web Soil Survey at
<http://websoilsurvey.nrcs.usda.gov> for official and
 current USDA soil information as viewable maps and
 tables. Visit the Soil Data Mart at soildatamart.usda.gov
 download SSURGO certified soil tabular /spatial data.

Drainage Classification

Drainage class (natural) refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil.

Seven classes of natural soil drainage are recognized—excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the “Soil Survey Manual.”



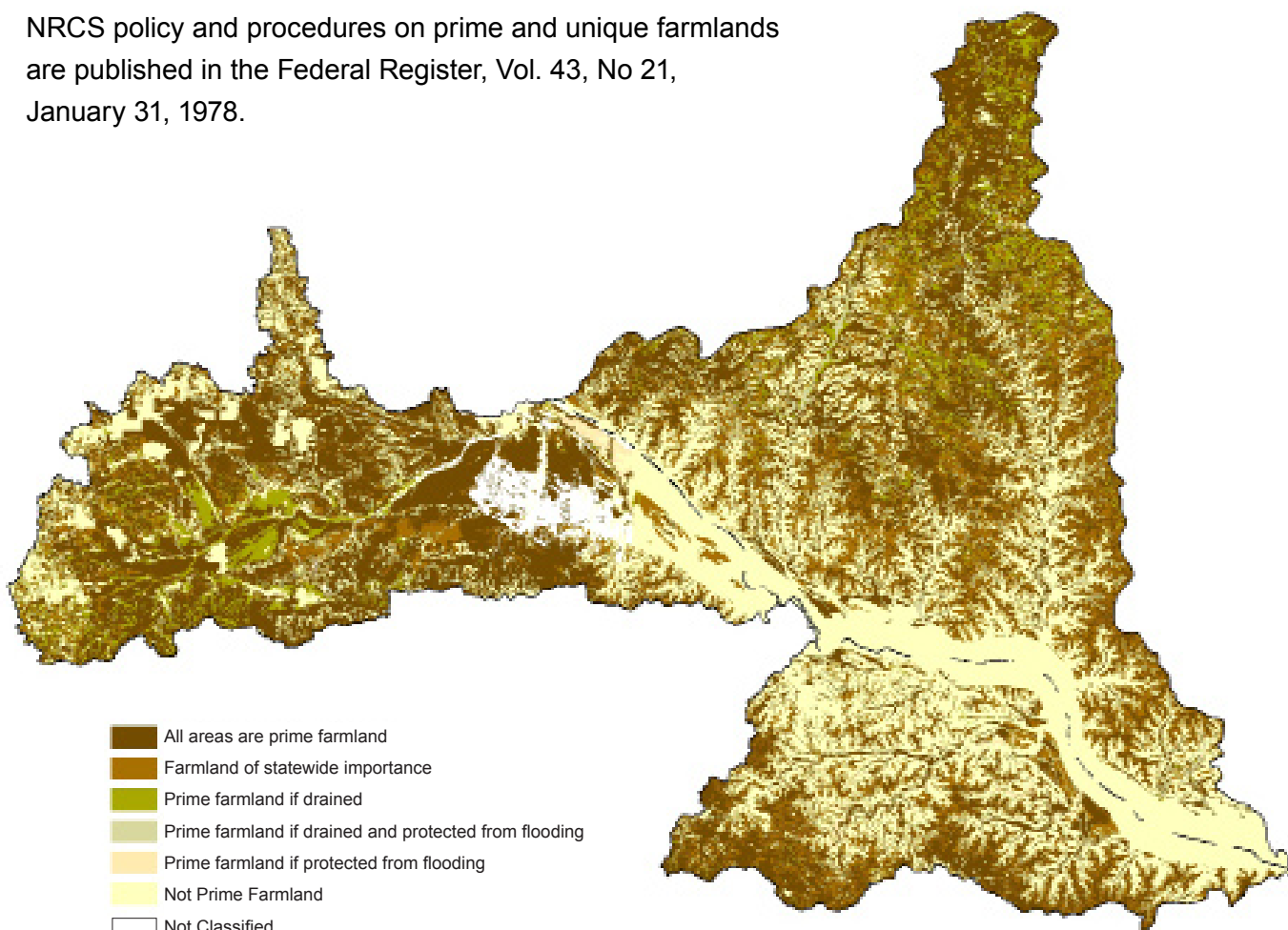
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Farmland Classification

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland.

Farmland classification identifies the location and extent of the most suitable land for producing food, feed, fiber, forage, and oilseed crops.

NRCS policy and procedures on prime and unique farmlands are published in the Federal Register, Vol. 43, No 21, January 31, 1978.



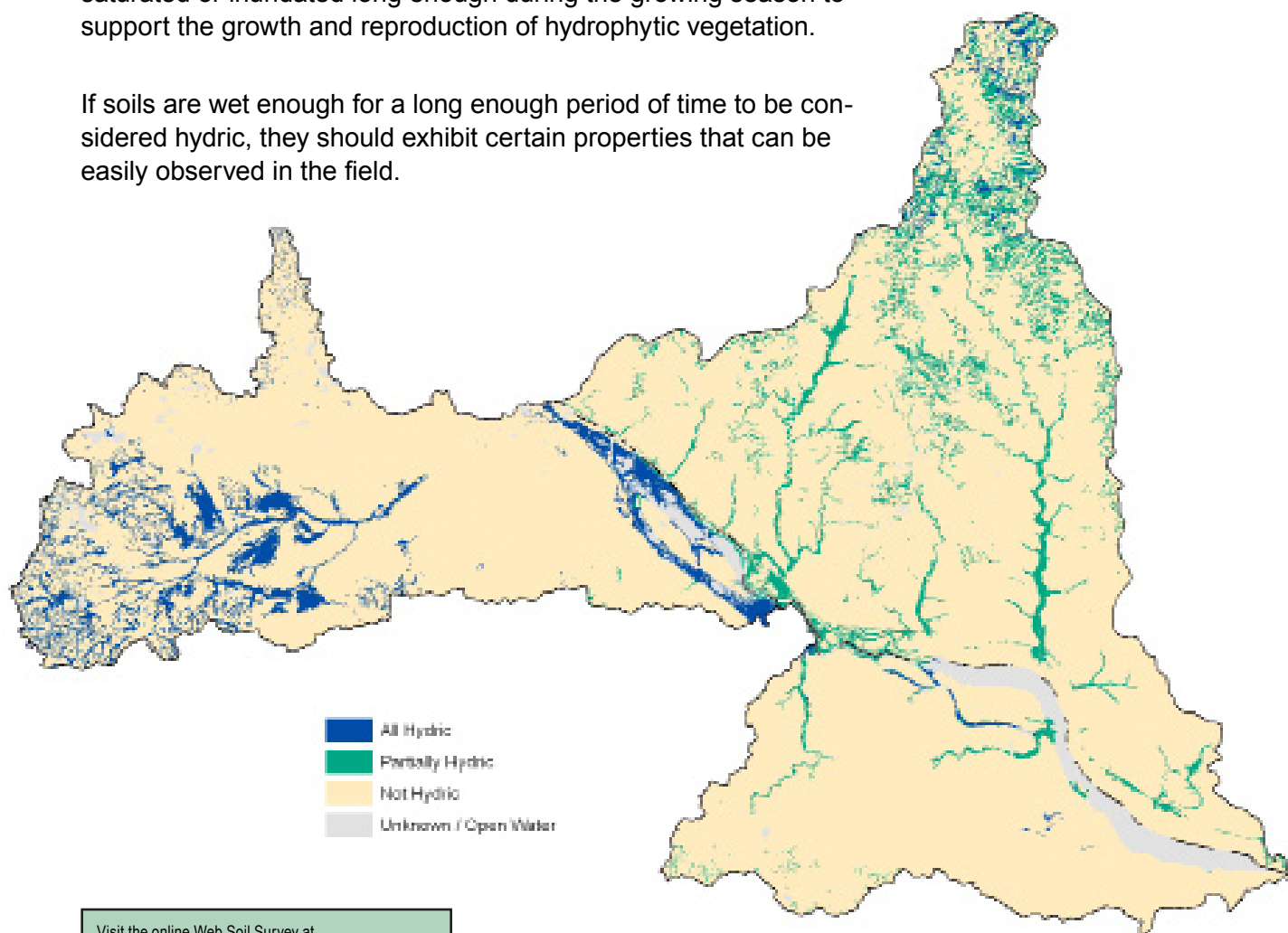
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Hydric Soils

This rating provides an indication of the proportion of the map unit that meets criteria for hydric soils. Map units that are dominantly made up of hydric soils may have small areas, or inclusions of nonhydric soils in the higher positions on the landform. Map units of dominantly non-hydric soils may therefore have inclusions of hydric soils in the lower positions on the landform.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as “soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part” (Federal Register 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field.



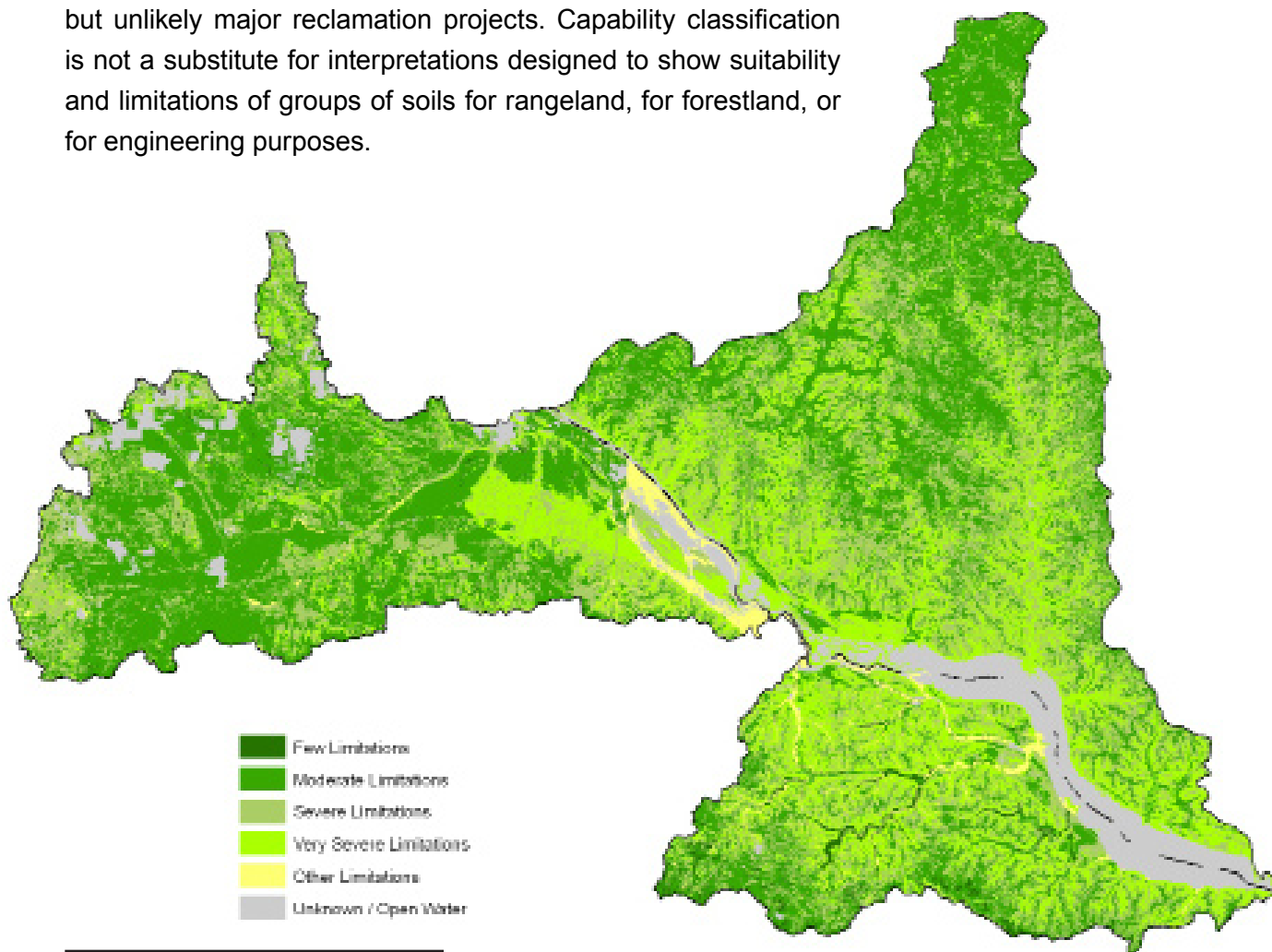
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*Note: Historical Hydric Soil Determination Standards, scale, and methodology can vary on a county-to-county basis,
 leading to irregularities in thematic maps representing hydric soil determinations.*

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management.

The criteria used in grouping the soils does not include major and generally expensive land forming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes.



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Performance Results System Data

PRS Performance Measures	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07	MN & WI TOTALS
Total Conservation Systems Planned (acres)	1,620	14,289	12,919	25,910	14,431	N / A	15,324	20,822	10,155	115,470
Total Conservation Systems Applied (acres)	2,238	9,836	12,517	24,496	11,885	N / A	9,805	15,559	13,565	99,901
Conservation Practices										
Total Waste Management (313) (numbers)	141	1	0	0	1	0	1	0	0	144
Riparian Forest Buffers (391) (acres)	54	15	77	25	70	33	9	0	2	285
Erosion Control Total Soil Saved (tons/year)	673	107,290	41,509	74,047	46,388	N / A	N / A	N / A	N / A	269,907
Total Nutrient Management (590) (Acres)	141	3,456	4,452	3,187	4,220	2,355	757	734	4,945	24,247
Pest Management Systems Applied (595A) (Acres)	0	84	0	667	6	0	141	362	350	1,610
Prescribed Grazing 528a (acres)	32	324	346	147	480	1,109	213	296	296	3,243
Tree & Shrub Establishment (612) (acres)	17	1,172	259	1,286	513	322	75	12	169	3,825
Residue Management (329A-C) (acres)	472	7,286	12,060	9,793	7,414	856	3,136	9,552	1,876	52,445
Total Wildlife Habitat (644 - 645) (acres)	1,000	10,624	2,364	9,521	1,578	271	1,190	1,806	2,815	31,169
Total Wetlands Created, Restored, or Enhanced (acres)	55	227	213	40	41	43	30	0	0	649
Acres enrolled in Farmbill Programs										
Conservation Reserve Program	1,184	3,923	2,005	12,518	924	N / A	862	431	1,505	23,352
Wetlands Reserve Program	0	0	0	0	0	N / A	0	0	0	0
Environmental Quality Incentives Program	289	1,391	1,562	1,171	983	N / A	5,258	8,929	8,589	28,172
Wildlife Habitat Incentive Program	0	0	0	0	0	N / A	4	0	0	4
Farmland Protection Program	0	0	0	0	0	N / A	0	0	0	0

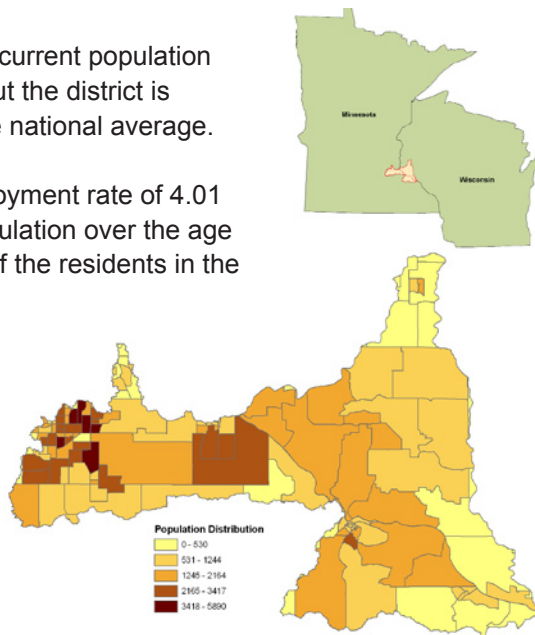
Socioeconomic and Agricultural Data (Relevant)

Estimations for the Rush-Vermillion subbasin indicate a current population of 185,140 people. Median household income throughout the district is approximately \$62,130 annually, roughly 34% above the national average.

Unemployment figures for the basin indicate an unemployment rate of 4.01 percent. Census data shows seventy percent of the population over the age of 18 is active in the workforce, and approximately 7% of the residents in the watershed are living below the national poverty level.

Assessment estimates indicate 2,421 farms in the watershed. Approximately forty nine percent of the operations are less than 180 acres in size, forty six percent are from 180 to 1000 acres in size, and the remaining farms are greater than 1000 acres in size.

Of the 2,455 Operators in the Basin, fifty seven percent are full time producers not reliant on off-farm income.



(MN) HUC# 7040001		Total Acres:	709,411
Population Data*	Watershed Population	185,140	
	Unemployment Rate	4%	
	Median Household Income	62,131	
	% below poverty level	5%	
	Median Value of Home	124,189	
Farms	# of Farms	2,421	
	# of Operators	2,455	Percent
	# of Full Time Operators	1,400	57%
	# of Part Time Operators	1,055	43%
	Total Crop/Pasturelands:	177,000	25.0%
Farm Size	1 to 179 Acres	1193	49%
	180 to 499 Acres	878	36%
	500 to 999 Acres	240	10%
	1,000 Acres or more	109	4%
Livestock & Poultry (Numbers)	Cattle - Beef	8,554	4%
	Cattle - Dairy	24,970	12%
	Chicken	5,879	3%
	Swine	49,024	23%
	Turkey	14,480	7%
	Other	112,101	52%
	Animal Count Total:	215,009	
	Total Permitted AFOs (MN):	564	

* Adjusted by percent of HUC in the county or by percent of block group area in the HUC, depending on the level of data available

THREATENED AND ENDANGERED SPECIES ¹⁴

NRCS assists in the conservation of threatened and endangered species and avoids or prevents activities detrimental to such species. NRCS' concern for these species includes the species listed by the Secretary of the Interior (as published in the Federal Register) and species designated by state agencies. The following is a list of threatened, endangered, and candidate species as well as species of special concern that occur in the Minnesota portion of the subbasin.

Scientific Name	Common Name	Type	Scientific Name	Common Name	Type
<i>Acipenser fulvescens</i>	Lake Sturgeon	Zoological	<i>Hudsonia tomentosa</i>	Beach-heather	Botanical
<i>Actinonaias ligamentina</i>	Mucket	Zoological	<i>Ictiobus niger</i>	Black Buffalo	Zoological
<i>Alasmidonta marginata</i>	Elktoe	Zoological	<i>Lampsilis higginsii</i>	Higgins Eye	Zoological
<i>Alosa chrysochloris</i>	Skipjack Herring	Zoological	<i>Lampsilis teres</i>	Yellow Sandshell	Zoological
<i>Ammocrypta asprella</i>	Crystal Darter	Zoological	<i>Lanius ludovicianus</i>	Loggerhead Shrike	Zoological
<i>Ammodramus henslowii</i>	Henslow's Sparrow	Zoological	<i>Lasmigona costata</i>	Fluted-shell	Zoological
<i>Apalone mutica</i>	Smooth Softshell	Zoological	<i>Lechea tenuifolia</i>	Narrow-leaved Pinweed	Botanical
<i>Aristida tuberculosa</i>	Sea-beach Needlegrass	Botanical	<i>Lesquerella ludoviciana</i>	Bladder Pod	Botanical
<i>Asclepias amplexicaulis</i>	Clasping Milkweed	Botanical	<i>Ligumia recta</i>	Black Sandshell	Zoological
<i>Besseyia bullii</i>	Kitten-tails	Botanical	<i>Megalania nervosa</i>	Washboard	Zoological
<i>Buteo lineatus</i>	Red-shouldered Hawk	Zoological	<i>Minuartia dawsonensis</i>	Rock Sandwort	Botanical
<i>Carex sterilis</i>	Sterile Sedge	Botanical	<i>Myotis septentrionalis</i>	Northern Myotis	Zoological
<i>Cirsium hillii</i>	Hill's Thistle	Botanical	<i>Notropis amnis</i>	Pallid Shiner	Zoological
<i>Clemmys insculpta</i>	Wood Turtle	Zoological	<i>Obovaria olivaria</i>	Hickorynut	Zoological
<i>Coluber constrictor</i>	Eastern Racer	Zoological	<i>Oenothera rhombipetala</i>	Rhombic-petaled Evening Primrose	Botanical
<i>Cristatella jamesii</i>	James' Polania	Botanical	<i>Orobancha fasciculata</i>	Clustered Broomrape	Botanical
<i>Crotalus horridus</i>	Timber Rattlesnake	Zoological	<i>Panax quinquefolius</i>	American Ginseng	Botanical
<i>Cycleptus elongatus</i>	Blue Sucker	Zoological	<i>Pipistrellus subflavus</i>	Eastern Pipistrelle	Zoological
<i>Cyclonaias tuberculata</i>	Purple Wartyback	Zoological	<i>Pituophis catenifer</i>	Gopher Snake	Zoological
<i>Dendroica cerulea</i>	Cerulean Warbler	Zoological	<i>Plethobasus cyphus</i>	Sheepnose	Zoological
<i>Desmodium cuspidatum</i> var. <i>longifolium</i>	Big Tick-trefoil	Botanical	<i>Pleurobema coccineum</i>	Round Pigtoe	Zoological
<i>Dicentra canadensis</i>	Squirrel-corn	Botanical	<i>Polyodon spathula</i>	Paddlefish	Zoological
<i>Dryopteris goldiana</i>	Goldie's Fern	Botanical	<i>Quadrula fragosa</i>	Winged Mapleleaf	Zoological
<i>Ellipsaria lineolata</i>	Butterfly	Zoological	<i>Quadrula metanevra</i>	Monkeyface	Zoological
<i>Elliptio crassidens</i>	Elephant-ear	Zoological	<i>Quadrula nodulata</i>	Wartyback	Zoological
<i>Elliptio dilatata</i>	Spike	Zoological	<i>Sanicula trifoliata</i>	Beaked Snakeroot	Botanical
<i>Empidonax virescens</i>	Acadian Flycatcher	Zoological	<i>Scutellaria ovata</i>	Ovate-leaved Skullcap	Botanical
<i>Emydoidea blandingii</i>	Blanding's Turtle	Zoological	<i>Seiurus motacilla</i>	Louisiana Waterthrush	Zoological
<i>Eryngium yuccifolium</i>	Rattlesnake-master	Botanical	<i>Solidago sciaphila</i>	Cliff Goldenrod	Botanical
<i>Falco peregrinus</i>	Peregrine Falcon	Zoological	<i>Trillium nivale</i>	Snow Trillium	Botanical
<i>Fusconaia ebena</i>	Ebonyshell	Zoological	<i>Tritogonia verrucosa</i>	Pistolgrip	Zoological
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Zoological	<i>Valeriana edulis</i> ssp. <i>ciliata</i>	Valerian	Botanical

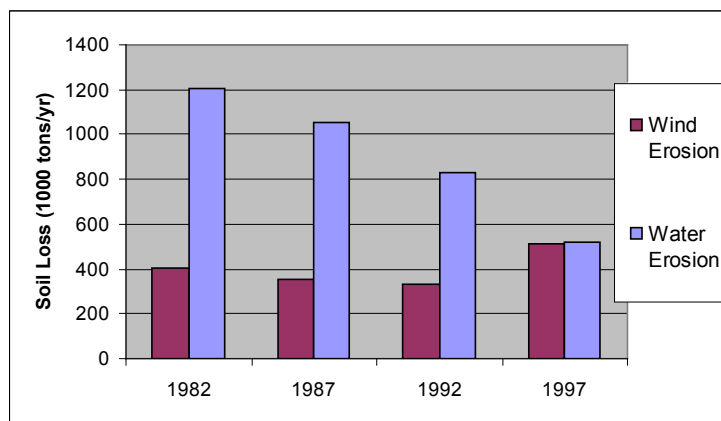
RESOURCE CONCERNS

County Soil and Water Conservation Districts in the watershed have identified the following resource concerns as top priorities for conservation and cost sharing efforts:

- Sediment and Erosion Control.** Excessive amounts of suspended solids from cropland, urban lands, streambanks and streambeds is a primary threat to area waters. Working hand-in-hand with stormwater pollution and prevention plans and nutrient management plans, counties in the watershed seek to retain water on the landscape to reduce flooding and subsequent soil erosion, and improve water resources.
- Stormwater Management.** Local districts recognize that stormwater runoff volume from impervious surfaces will likely increase as development of the watershed continues. Existing stormwater systems typically bypass treatment plants and discharge storm water directly into sinkholes and streams
- Drinking Water and Source Water Protection.** Parts of the region are particularly susceptible to groundwater contamination. Ease of infiltration, aging septic systems, abandoned wells and historical tiling practices threaten public drinking water supplies.
- Feedlot and Animal Waste Management.** Managing farms to minimize excess nutrients, pathogens, and odors released into the environment is important to the health of surface and ground water. Setback of open tile intakes and placement of agricultural waste systems in high priority riparian areas and areas with highly permeable soils will greatly reduce the effects of animal feed operations on area waters.
- Nutrient Management.** Excessive amounts of nutrients, namely phosphorus and nitrogen, contaminate groundwater and create nuisance algae presence in area waters. Major contributors are cropland, urban grasses, municipal wastewater, aging or non-compliant septic systems, and internal cycling.
- Wetland Management.** Due to the historical draining of much of the areas wetlands and agricultural practices, priority is given to both wetland preservation and restoration. Wetlands that have been filled and drained retain their characteristic soil and hydrology, often allowing their natural functions to be reclaimed. Restoration is a complex process requiring planning, implementation, monitoring, and management.

NRI Soil Loss Estimates ^{/13}

- NRI estimates for sheet and rill erosion by water on the cropland and pastureland **decreased** by approximately 685,100 tons (57%) of soil between 1982 and 1997.
- NRI estimates indicate wind erosion rates **increased** by 155,000 tons (44%) between 1982 and 1997.



Watershed Projects, Plans and Monitoring

- **Agricultural Land Buffer Incentive Program**
Minnesota Department of Agriculture
- **Lake Pepin Water Resource Protection Plan**
DNR, USFWS, NRCS, DAI
- **Southeast Minnesota Wastewater Initiative**
U of M, MPCA, BALMM
- **Lake Pepin Watershed TMDL**
MN Pollution Control Agency
- **Lower Mississippi Regional TMDL Plan**
MN Pollution Control Agency
- **Vermillion River Watershed TMDL Plan**
Minnesota Pollution Control Agency
- **Wetland Inventory Project**
Dakota County SWCD
- **Driftless Area Restoration Effort**
Trout Unlimited, US Fish and Wildlife Service
- **Lindell (Vermillion River) Restoration Project**
Met Council, DNR, Dakota SWCD
- **Driftless Area Initiative**
DAI, NRCS, FSA, FWS, Forest Service, State DNRs
- **EPA Targeted Watersheds Grant Project**
US EPA, Vermillion River Joint Powers Board
- **Basin Alliance for the Lower Mississippi in MN**
(BALMM)
- **Mississippi River Env. Management Program**
US Army Corps of Engineers
- **Mississippi Source Water Protection Project**
Minnesota Department of Health
- **Mississippi River WS Forest Partnership**
USDA Forest Service
- **Mississippi River Watershed Fund**
USDA Forest Service / National Fish & Wildlife Federation
- **Mississippi River Basin W.Q. Plan**
Minnesota Pollution Control Agency
- **South Creek Trout Stream Restoration Project**
Dakota County, DNR, Trout Unlimited, Lakeville High School

Conservation Districts, Organizations & Partners

- **Basin Alliance for the Lower Mississippi in MN**
18 Wood Lake Drive SE Rochester, MN 55904
Phone (507) 280-3592
- **Southeast Minnesota Wastewater Initiative**
863 30th Ave SE Rochester, MN 55904
Phone (507) 280-5575
- **Dakota County SWCD**
4100 220th St W 102, Farmington, MN 55024
Phone (651) 480-7777
- **Trout Unlimited Hiawatha Chapter**
Web: <http://www.mntu.org/index.php>
Phone (507) 287-6101
- **Driftless Area Initiative**
150 West Alona Lane Lancaster, WI 53813
Phone (608) 723-6377 ext.135
- **Vermillion River Watershed Joint Powers Org.**
4100 220th St. West, Suite 102 Farmington, MN 55024
Phone 651-480-7777
- **Goodhue County SWCD**
104 E 3rd Ave PO Box 335, Goodhue, MN 55027
Phone (651) 923-5300
- **Wabasha County SWCD**
611 Broadway Ave Ste 10, Wabasha, MN 55981
Phone (651) 565-4673
- **Green Lands, Blue Waters**
1991 Buford Circle #411 St. Paul, MN 55108
Phone (612) 625-8235
- **Washington Conservation District**
1380 W Frontage Rd Hwy 36, Stillwater, MN 55082
Phone (651) 275-1136
- **Hiawatha Valley RC&D**
1485 Industrial Drive NW Rochester, MN 55901
Phone (507) 282-6153
- **Minnesota NRCS - USDA**
375 Jackson Street, Suite 600 St Paul, MN 55101
On the Web: www.mn.nrcs.usda.gov
- **Scott County SWCD**
7151 W 190th St Ste 125, Jordan, MN 55352
Phone (952) 492-5425
- **Wisconsin NRCS - USDA**
8030 Excelsior Drive Madison, WI 53717-2906
On the Web: www.wi.nrcs.usda.gov

Footnotes / Bibliography

1. Ownership Layer – Source: MN Stewardship Data: Minnesota Department of Natural Resources, Section of Wildlife, BRW, Inc, 2007. This is the complete GAP Stewardship database containing land ownership information for the entire state of Minnesota. Date of source material is variable and ranges from 1976 to 2007, although a date range of 1983 to 1985 predominates. Land interest is expressed only when some organization owns or administers more than 50% of a forty except where DNR could create sub-forty accuracy polygons.
2. National Land Cover Dataset (NLCD) - Originator: U.S. Geological Survey (USGS); Publication date: 19990631; Title: Minnesota Land Cover Data Set, Edition: 1; Geospatial data presentation form: Raster digital data; Publisher: U.S. Geological Survey, Sioux Falls, SD, USA.
3. Ownership layer classes grouped to calculate Public ownership vs. Private and Tribal ownership by Minnesota NRCS Rapid Watershed Assessment Staff. Land cover / Land use data was then extracted from the National Landcover Dataset Classification System and related to ownership class polygons.
4. U.S. Geological Survey National Hydrography Dataset (NHD) 1:100,000-scale Digital Line Graph (DLG) medium resolution hydrography data, integrated with reach-related information from the U.S. Environmental Protection Agency Reach File Version 3.0 (RF3). The Hydro 100k layer was compared to MPCA's 303(d) data to derive percentage of listed waters.
5. Land Cover / Land Use / Hydro 100k Buffer. Using the 100k Hydrology dataset, All streams within HUC were spatially buffered to a distance of 100 ft. National Landcover Dataset attributes were extracted for the spatial buffer to demonstrate the vegetation and landuse in vulnerable areas adjacent to waterways.
6. Land Capability Class. ESTIMATES FROM THE 1997 NRI DATABASE (REVISED DECEMBER 2000) REPLACE ALL PREVIOUS REPORTS AND ESTIMATES. Comparisons made using data published for the 1982, 1987, or 1992 NRI may produce erroneous results. This is because of changes in statistical estimation protocols and because all data collected prior to 1997 were simultaneously reviewed (edited) as 1997 NRI data were collected. All definitions are available in the glossary. In addition, this December 2000 revision of the 1997 NRI data updates information released in December 1999 and corrects a computer error discovered in March 2000. For more information: <http://www.nrcs.usda.gov/technical/NRI/>
7. 1997 NRI Irrigated Land Estimates. Irrigated land: Land that shows evidence of being irrigated during the year of the inventory or during two or more years out of the last four years. Water is supplied to crops by ditches, pipes, or other conduits. Water spreading is not considered irrigation; it is recorded as a conservation practice. [NRI-97] For more information: <http://www.nrcs.usda.gov/technical/NRI/>
8. 303(d) Stream data. Minnesota's Final Impaired Waters (per Section 303(d) Clean Water Act), 2006. Data obtained from Minnesota Pollution Control Agency (MPCA). The Minnesota Pollution Control Agency (MPCA) helps protect state water by monitoring quality, setting standards and controlling inputs through the development of TMDL plans. <http://www.pca.state.mn.us/water/tmdl/index.html#maps>.

Footnotes / Bibliography (continued)

9. National Coordinated Common Resource Area (CRA) Geographic Database. A Common Resource Area (CRA) map delineation is defined as a geographical area where resource concerns, problems, or treatment needs are similar. It is considered a subdivision of an existing Major Land Resource Area (MLRA) map delineation or polygon. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographic boundaries of a Common Resource Area

10. Soil Survey Geographic Database (SSURGO) Tabular and spatial data obtained from NRCS Soil Data Mart at <http://soildatamart.nrcs.gov>. Publication dates vary by county. Component and layer tables were linked to the spatial data via SDV 5.1 and ARCGIS 9.1 to derive the soil classifications presented in these examples. Highly Erodible Land Classification Data obtained from USDA/NRCS EFOTG Section II, County Soil Data. HEL classifications were appended to SSURGO spatial data via an ARCEdit session. Addendum and publication dates vary by county.

11. Lands removed from production through farm bill programs. County enrollment derived from the following: CRP Acres: www.fsa.usda.gov/crpstorpt/07Approved/r1sumyr/mn.htm (7/30/04). CREP Acres: <http://www.bwsr.state.mn.us/easements/crep/easementssummary.html> (7/31/03). WRP Acres: NRCS (8/16/04). Data were obtained by county and adjusted by percent of HUC in the county.

12. Socioeconomic and Agricultural Census Data were taken from the U.S. Population Census, 2000 and 2002 Agricultural Census and adjusted by percent of HUC in the county or by percent of zip code area in the HUC, depending on the level of data available. Data were also taken from MPCA AFO/CAFO counts provided by county for 2005.

13. 1997 NRI Estimates for sheet and rill erosion (WEQ & USLE). The NRI estimates sheet and rill erosion together using the Universal Soil Loss Equation (USLE). The Revised Universal Soil Loss Equation (RUSLE) was not used in the 1997 NRI. RUSLE was not available for previous inventories, therefore the use of USLE was continued to preserve the trending capacity of the NRI database. Wind erosion is estimated using the Wind Erosion Equation (WEQ). For further information visit <http://www.mn.nrcs.usda.gov/technical/nri/findings/erosion.htm>

14. Federally listed endangered and threatened species counts obtained from NRCS Field Office Technical Guide, Section II, Threatened and Endangered List. <http://www.nrcs.usda.gov/Technical/efotg/>. Where listed, Essential fish habitat as established by Magnuson-Stevens Fishery Conservation and Management Act, Public Law 94-265, as amended through October 11, 1996 <http://www.nmfs.noaa.gov/sfa/magact/>

15. Watershed Projects, Plans, Monitoring. Natural Resources Conservation Service, Watershed Projects Planned and Authorized, <http://www.nrcs.usda.gov/programs/watershed/Purpose>. Additional Information on listed individual projects can be obtained from the noted parties.